

[CLAIMS]

1. An arrangement for manufacturing a PET bottle having a handle formed on a body, comprising:
 - a preform blow mold for blowing air into a preform to expand the preform in a predetermined ratio to a complete shape so as to allow a handle section to be compressed;
 - a blow mold having a handle forming portion for compressing both sides of the bottle to form the handle section;
 - 10 a cutting apparatus including a mold punch for cutting off the compressed portion of the handle section compressed by the handle forming portion;
 - 15 a bonding apparatus for bonding the compressed portion of the handle section compressed by the handle forming portion or a cut-off portion remaining in the handle section after cutting off the compressed portion of the handle section; and
 - 20 a conveyer for conveying the preform or the molded PET bottle while clamping a neck of the preform or a neck of the molded PET bottle.
2. The arrangement as set forth in claim 1, further comprising a bottle-shaped blow mold having a handle forming portion configured to penetrate the body of the bottle upon compressing both sides of the bottle.
 - 25 3. The arrangement as set forth in claim 1 or 2, wherein the bonding apparatus is an insert injection mold for bonding ends of the cut-off portion to each other by insert injection, the insert injection mold including a compressing member for compressing both sides of an intermediate portion of the cut-off portion remaining in the handle section after cutting off the compressed portion of the handle section.

4. The arrangement as set forth in claim 1 or 2, wherein the bonding apparatus is an ultrasonic bonding apparatus for compressing and bonding the compressed portion of the handle section or the cut-off portion 5 remaining in the handle section after cutting off the compressed portion of the handle section.

5. An arrangement for manufacturing a PET bottle having a handle formed on a body, comprising:

10 a preform blow mold for blowing air into a preform to expand the preform in a predetermined ratio to a complete shape so as to allow a handle section to be compressed;

a handle forming device having a handle forming portion for compressing both sides of the bottle so as to form the handle section;

15 an ultrasonic bonding apparatus equipped to an end of the handle forming portion for bonding a compressed portion at both sides of the handle section;

20 a cutting apparatus including a mold punch for cutting off the compressed portion of the handle section compressed by the handle forming portion; and

a conveyer for conveying the preform or the molded PET bottle while clamping a neck of the preform or a neck of the molded PET bottle.

6. A method of manufacturing a PET bottle having a 25 handle formed on a body, comprising the steps of:

a) performing a first blowing operation to blow compressed air into a preform manufactured by injection molding in order to form a first hollow PET container after mounting the preform to a preform blow mold;

30 b) performing a second blowing operation to blow compressed air into the first PET container in order to form a second PET container having a handle section formed

on a predetermined area of the second PET container after mounting the first PET container to a blow mold having a handle forming portion;

5 c) cutting off a compressed portion of the handle section of the second PET container in order to form a third PET container; and

d) bonding a cut-off portion remaining in the handle section of the third PET container after the step c) in order to form a fourth PET container.

10 7. The method as set forth in claim 6, wherein, in the step d), the fourth PET container is formed by bonding the cut-off portion remaining in the handle section of the third PET container to a predetermined thickness through insert injection molding in an insert injection mold.

15 8. The method as set forth in claim 6, wherein, when the second PET container has a large thickness, the step c) is performed by use of a mold punch having a heater installed on an end of the mold punch.

20 9. The method as set forth in claim 6, wherein, in the step d), the fourth PET container is formed by bonding the cut-off portion remaining in the handle section of the third PET container to a predetermined thickness by means of ultrasonic bonding.

25 10. A method of manufacturing a PET bottle having a handle formed on a body, comprising the steps of:

a) performing a first blowing operation to blow compressed air into a preform manufactured by injection molding in order to form a first hollow PET container after mounting the preform to a preform blow mold;

30 b) performing a second blowing operation to blow compressed air into the first PET container in order to

form a second PET container having a handle section formed on a predetermined area of the second PET container after mounting the first PET container to a blow mold having a handle forming portion;

5 c) bonding a compressed portion of the handle section of the second PET container by means of ultrasonic bonding in order to form a third PET container; and

10 d) cutting off the compressed portion of the handle section of the third PET container in order to form a fourth PET container.

11. A method of manufacturing a PET bottle having a handle formed on a body, comprising the steps of:

15 a) performing a first blowing operation to blow compressed air into a preform manufactured by injection molding in order to form a first hollow PET container after mounting the preform to a preform blow mold;

20 b) performing a second blowing operation to blow compressed air into the first PET container in order to form a second PET container having a handle section formed on a predetermined area of the second PET container after mounting the first PET container to a blow mold having a handle forming portion; . . .

25 c) cutting off a compressed portion of the handle section of the second PET container in order to form a third PET container; and

30 d) bonding a cut-off portion remaining in the handle section of the third PET container after the step c) in order to form a fourth PET container; and

35 e) blowing compressed air into the fourth PET container in order to form a fifth PET container after mounting the fourth PET container to a bottle-shaped blow mold having a handle forming portion penetrating a body of the fourth PET container upon blowing.

12. The method as set forth in claim 11, wherein, in the step d), the fourth PET container is formed by bonding the cut-off portion of the handle section of the third PET container to a constant thickness by means of insert injection molding in an insert injection mold or by means of ultrasonic bonding.

5 13. A method of manufacturing a PET bottle having a handle formed on a body, comprising the steps of:

a) performing a first blowing operation to blow compressed air into a preform manufactured by injection molding in order to form a first hollow PET container after mounting the preform to a preform blow mold;

10 b) performing a second blowing operation to blow compressed air into the first PET container in order to form a second PET container having a handle section formed on a predetermined area of the second PET container after mounting the first PET container to a blow mold having a handle forming portion;

15 c) bonding a compressed portion of the handle section of the second PET container by means of ultrasonic bonding in order to form a third PET container;

d) cutting off the compressed portion of the handle section of the third PET container in order to form a fourth PET container; and

20 e) blowing compressed air into the fourth PET container in order to form a fifth PET container after mounting the fourth PET container to a bottle-shaped blow mold having a handle forming portion penetrating a body of the fourth PET container upon blowing.

30 14. A method of manufacturing a PET bottle having a handle formed on a body, comprising the steps of:

a) performing a first blowing operation to blow compressed air into a preform manufactured by injection

molding in order to form a first hollow PET container after mounting the preform to a preform blow mold;

5 b) compressing both sides of a handle section of the first PET container by use of a handle forming device having a handle forming portion while bonding a compressed portion of the handle section by use of an ultrasonic bonding apparatus installed on an end of the handle forming portion in order to form a second PET container;

10 c) cutting off the compressed portion of the handle section of the second PET container in order to form a third PET container; and

15 d) blowing compressed air into the third PET container in order to form a fourth PET container after mounting the third PET container to a bottle-shaped blow mold having a handle forming punch penetrating a body of the fourth PET container upon blowing.

15. A PET bottle having a handle formed on a body manufactured by an arrangement as set forth any one of claims 1 to 5 or a method as set forth any one of claims 6
20 to 14.